



TITLE:

3. Effect of Helium and Hydrogen Atoms on the Formation of Voids in Quenched Aluminium(東京理科大学理学部物理学教室,修士論文アブストラクト(1980年度))

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Foils of beta-brass are quenched from various temperatures ranging from 500° to 800° into brine bath kept at -5°C and are examined by transmission electron microscopy. It is revealed that the defects observed in beta-brass distribute with a network and consist of dislocation loops and zigzag dislocations. These defects are considered to be related to the order-disorder transition via vacancy mechanisms. Monte Carlo simulation is performed to examine behaviour of vacancies during ordering. This result shows that almost all vacancies accumulate around anti-phase domain boundaries (APB).

3. Effect of Helium and Hydrogen Atoms on the Formation of Voids in Quenched Aluminium

Yumi MORISHITA

Dilute aluminium alloys (Al-Ge, Al-Cu, Al-Ag) and 5-nine aluminium have been quenched in vacuum, helium or hydrogen atmosphere, and the formation of the secondary defects has been examined with an electron microscope. It has been made clear that helium atoms as well as hydrogen ones affect the formation of voids and the promotive effect of helium atoms is smaller than that of hydrogen ones. Using a set of rate equations, the promotive effect of both atoms has been discussed from the differences in solubility, migration energy and binding energy between a vacancy and a void containing a helium or hydrogen atom. It is concluded that the difference may be mainly caused by binding energy. The value of binding energy for a small void formed in helium atmosphere is inferred.

4. Studies of Random Structure by Positron Annihilation

Takashi MIHARA

The structural relaxation in the amorphous $\text{Fe}_{40}\text{Ni}_{40}\text{P}_{14}\text{B}_6$ alloy and the defects in electron irradiated germanium have been studied with positron annihilations as a microscopic probe in con-